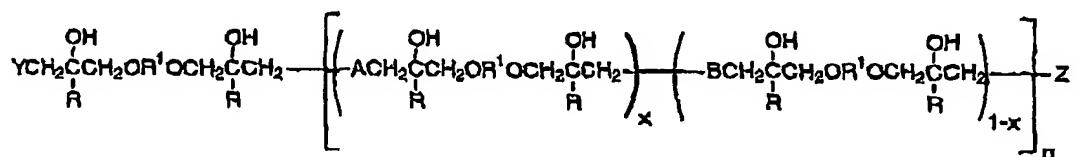


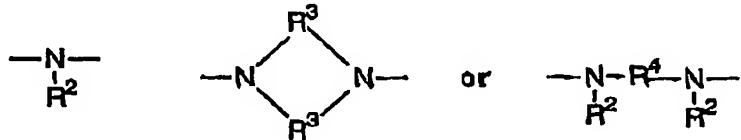
AMENDED CLAIMS

[received by the International Bureau on 24 January 2005 (24.01.05);
original claims 1-17 replaced by new claims 1-16 (5 pages)]

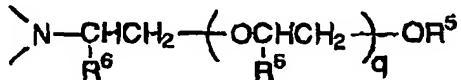
1. A water-soluble polymer comprising a copolyhydroxyaminoether having side-chains of polyalkylene oxides; wherein the water soluble polymer is represented by the formula:



wherein R is hydrogen or C₁-C₂₀ alkyl; R' is individually an aromatic or substituted aromatic moiety; Y is an organic moiety that does not contain an epoxy group and Z is an organic moiety, optionally containing an epoxy group; x is 0-0.99; and n is 5-400; each A is individually an amino group represented by one of the formulas:



wherein R² is hydrocarbyl or substituted hydrocarbyl; R³ is C₂-C₁₀ hydrocarbylene or substituted hydrocarbylene; R⁴ is C₂-C₂₀ hydrocarbylene or substituted hydrocarbylene, wherein the substituent(s) is hydroxyl, cyano, halo, arlyloxy, alkylamido, arylamido, alkylcarbonyl, or arylcarbonyl; and each B is represented by the formula:



wherein R⁵ is hydrocarbyl; each R⁶ is individually hydrogen, methyl, ethyl, hydrocarbyl or combinations

(change made for consistency) thereof; and x is 0-0.99 when q is greater than 40 but less than 0.2 or greater than 0.8 when q is less than 40.

2. The polymer of Claim 1 wherein R is
5 hydrogen; each R¹ is individually isopropylidenediphenylene, 1,4-phenylene, 1,3-phenylene, methylenediphenylene, thiodiphenylene, carbonyldiphenylene, or combinations thereof; each R² is individually methyl, ethyl, phenyl, benzyl, 2-hydroxyethyl, 3-hydroxypropyl, 2-hydroxypropyl, 10 2,3-dihydroxypropyl, 2-(acetamido)ethyl, or combinations thereof; R³ and R⁴ are individually (change made for consistency) ethylene, 1,2-propylene, 1,2-butylene, or combinations thereof; and R⁵ is C₁-C₂₀ alkyl, R⁶ is a mixture 15 of hydrogen and methyl; each of Y and Z are individually bis(2-hydroxyethyl)amino or N-(2-hydroxyethyl)piperazinyl, q is 20 - 50, and n is 10 - 25.

3. The polymer of Claim 2 wherein R¹ is isopropylidenediphenylene and R² is 2-hydroxyethyl.

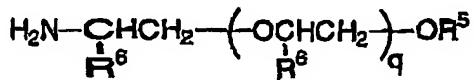
4. The polymer of Claim 2 wherein each R⁵ is
20 individually hydrogen, methyl, ethyl, propyl, butyl, benzyl or combinations thereof; Y and Z are bis(2-hydroxyethyl)amino.

5. A process for preparing a water-soluble polymer which comprises (1) reacting an equivalent or
25 excess of a difunctional amine or mixtures thereof with an excess or equivalent amount of a diglycidyl ether of a bisphenol or mixtures thereof, optionally in the presence of a monofunctional nucleophile and optionally in the presence of a catalyst and/or a solvent; or (2) reacting an equivalent or excess of a difunctional amine or mixtures

thereof with an excess or equivalent amount of a diglycidyl ether of a bisphenol or mixtures thereof, optionally in the presence of a monofunctional nucleophile which functions as a terminating agent and, optionally, in the presence of a catalyst and/or a solvent; or (3) dissolving in an organic or non-organic solvent an amine selected from the group consisting of primary amine, a bis(secondry) diamine, or a mono-amine-functionalized poly(alkylene oxide) or mixtures thereof, adding to the amine solution a diglycidyl ether in an amine hydrogen equivalent to epoxide equivalent ratio of from 0.9:1 to 1.2:1 under conditions sufficient to cause the amine moieties to react with the epoxy moieties to form a polymer backbone having amine linkages, ether linkages and pendant hydroxyl moieties.

15 6. The process of Claim 5 wherein the non-organic solvent is water and the monofunctional nucleophile is selected from the group consisting of a secondary amine, hydrogen sulfide, ammonia, ammonium hydroxide, a monofunctional phenol, an aryloxide salt, a carboxylic acid, a carboxylic acid salt, a mercaptan, and thiolate salt.

20 7. The process of Claim 5 wherein the difunctional amine is ethanolamine or a primary amine having the formula:



25

Wherein R^5 , R^6 and q are as defined above; the diglycidyl ether of a bisphenol is the diglycidyl ether of bisphenol A.

8. The process of Claim 5 wherein the monofunctional nucleophile is selected from the group consisting of diethanolamine, N-(2-hydroxyethyl)piperazine, piperadine, diethylamine, dipropylamine, and dibenzylamine.

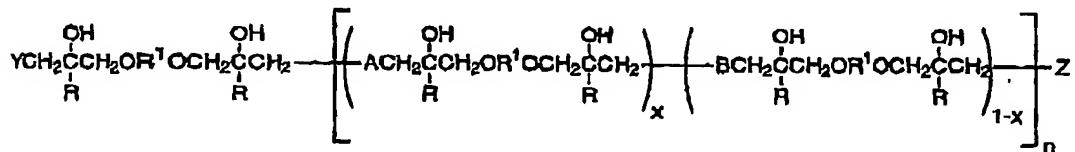
5 9. The process of Claim 5 wherein the monofunctional nucleophile is selected from the group consisting of phenol, acetic acid and propanoic acid and the catalyst is selected from the group consisting of a phosphonium or ammonium salt.

10 10. The process of Claim 5 wherein the solvent is selected from the group consisting of 1-methyl-2-pyrrolidone, N,N-dimethylacetamide, water, diglyme, triglyme, diethylene glycol ethyl ether, diethylene glycol methyl ether, or propylene glycol methyl ether.

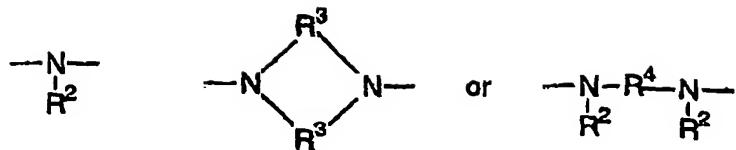
15 11. A water-soluble polymer prepared by the process of Claim 5.

12. A composition comprising an aqueous fluid and the water-soluble polymer of Claim 1.

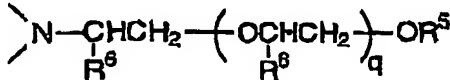
20 13. An aqueous solution comprising a polymer represented by the formula:



wherein each R is individually hydrogen or C₁-C₂₀ alkyl; R' is an aromatic or substituted aromatic moiety; Y is an organic moiety that does not contain an epoxy group and Z is an organic moiety, optionally containing an epoxy group; x is 0-0.99; and n is 5-400; each A is individually an amino group represented by one of the formulas:



wherein R^2 is hydrocarbyl or substituted hydrocarbyl; R^3 is C_2-C_{10} hydrocarbylene or substituted hydrocarbylene; R^4 is C_2-C_{20} hydrocarbylene or substituted hydrocarbylene; and each B is represented by the formula:



wherein R^5 is hydrocarbyl; each R^6 is individually hydrogen, methyl, ethyl, hydrocarbyl or mixtures thereof; and x is 0-0.99 when q is greater than 40, but less than 10 0.2 or greater than 0.8 when q is less than 40.

14. The aqueous solution of Claim 13 wherein in the formula representing the polymer, R is hydrogen; each R^1 is individually isopropylidenediphenylene, 1,4-phenylene, 1,3-phenylene, methylenediphenylene, thiodiphenylene, 15 carbonyldiphenylene, or combinations thereof; each R^2 is individually methyl, ethyl, phenyl, benzyl, 2-hydroxyethyl, 3-hydroxypropyl, 2-hydroxypropyl, 2,3-dihydroxypropyl, 2-(acetamido)ethyl, or combinations thereof; R^3 and R^4 are individually ethylene, 1,2-propylene, 1,2-butylene, or 20 combinations thereof; and R^5 is C_1-C_{20} alkyl.

15. The aqueous solution of Claim 13 wherein viscosity increases as temperature is increased.

16. A process which comprises dissolving the polymer of Claim 1 in water, the water optionally 25 containing acids, bases, salts, solvents, or mixtures thereof.